CASE REPORTS

Chronic Idiopathic Hypoparathyroidism Simulating Epilepsy

Report of a Case

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CHRONIC idiopathic hypoparathyroidism is an uncommon disease which has been recognized only recently. It is important to discover the condition in its early stages, for delay in correction of the fundamental metabolic disturbance may result in irreversible damage. Because the presenting symptom is often that of convulsions, the condition is frequently mis-diagnosed as epilepsy (as in the case presented here). Anticonvulsant drugs may control the seizures but do not affect the basic disease process.

The following case illustrates the problem of diagnosis, the course of the disease, and the response to therapy.

CASE REPORT

A white, married school teacher, aged 37 years, entered the out-patient department of the University of California Hospital on February 26, 1948, with complaint of convulsive attacks during the preceding five weeks. The first episode had occurred three weeks after the birth of a fourth child. Each attack consisted of loss of consciousness without premonition, tonic spasm of the body in extension without convulsive movement, biting of the tongue, or urinary incontinence, followed by several hours of deep sleep from which the patient awoke with severe headache that subsided gradually. There were no muscle cramps, and the attacks were not associated with stridor. The husband remarked upon the patient's "jumpiness" at night and said she seemed to have become less stable emotionally. In addition the patient's memory was severely impaired.

The family history and past history were not contributory. The patient's four pregnancies had terminated in full-term normal deliveries without complications; all the children were living and in good health. Upon physical examination, slow, halting speech and loss of facial expression were noted. Otherwise, the results of examination at that time were considered normal. An electroencephalogram was characterized by both generalized and focal dysrhythmia of nonspecific and paroxysmal patterns. The generalized dysrhythmia was exaggerated with hyperventilation and was compatible with convulsive susceptibility of moderate or pronounced degree. The focal dysrhythmia appeared to center in the right temporal and right frontal regions.

The patient entered the hospital on March 28, 1948. The physical condition was unchanged except for positive Hoffmann signs bilaterally with hypoactive knee and ankle jerks. There was considerable tightness of muscles and joints. In x-ray examination of the skull a density which, in retrospect, may have been a calcification in the basal ganglia was observed. Pneumoencephalograms were done and 100 cubic centimeters of clear fluid was removed. It contained 22 mg. of protein per 100 cc., and no cells; reactions to Pandy and Wassermann tests were negative and the colloidal gold curve was normal.

The patient was instructed to take diphenylhydantoin, 0.1 gm. daily, and phenobarbital, 0.03 gm. three times daily. One mild attack occurred the day after discharge, but none thereafter. However the patient remained quite confused mentally, could not be left home alone, had definite disturbance of affect and a tendency to laugh or cry without apparent reason.

In December 1948 the patient complained of blurring of vision. Incipient subcapsular cataracts were noted and in February 1949 an extracapsular extraction of the lens of the right eye was done. On a follow-up visit the following month, a physician who had not previously observed the patient, noting the combination of convulsive disorder and bilateral cataracts, ordered blood calcium and phosphorus determinations. The serum calcium level was 4.3 mg. and the phosphorus level 7.9 mg. per 100 cc., with serum proteins 6.3 gm. per 100 cc. (drop method). The patient was returned to the endocrine clinic where positive Chvostek and Trousseau signs and absence of calcium from the urine were noted. She was hospitalized with a tentative diagnosis of idiopathic hypoparathyroidism on June 8, 1949.

At this time the patient was thin, appeared middle-aged, spoke hesistantly and had occasional difficulty in articulation. Her memory was poor and her affect flat. Occasional jerking movements of the arms and a coarse tremor were noted. The joints were tight owing to muscle spasm, and the reflexes were generally hypoactive. Chvostek and Trousseau signs were strongly positive.

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In an electrocardiogram there was a prolonged Q-T interval (0.50 second) owing to a long S-T segment followed by a normal T wave. The electroencephalogram was similar to the first record and was not altered by intravenous injection of calcium. In x-ray examination of the skull, calcifications in the basal ganglia and a semilunar calcification in the left anterior fossa were noted. No evidence of nephrocalcinosis or stones in the urinary tract was observed in x-ray examination of the abdomen. X-ray studies of the entire mouth were carried out, but the stubby roots of teeth characteristic of the occurrence of hypoparathyroidism early in life were not present. This was considered evidence that the disease had developed after eruption of the permanent teeth. Because of reports of monilia infection in association with hypoparathyroidism,[3] cultures were made of material from the throat but the fungus was not grown on the medium.

Blood cell count, reaction to a Wassermann test, alkaline phosphatase content, sugar content (fasting) and corrected sedimentation rate were normal. Results of routine tests of the urine were normal, and repeatedly negative reaction to the Sulkowitch test demonstrated the absence of calcium from the urine.

Diphenylhydantoin and phenobarbital were discontinued on entry. Shortly thereafter the Ellsworth-Howard test[2] was carried out to establish whether or not the patient was responsive to parathyroid hormone. Two hundred units of parathyroid extract were given intravenously. Urine specimens were collected before and after injection and tested for phosphate clearance. Results were as follows:

	Blood — Mg. per 100 cc. of:		Urine		
Time	Calcium	Phosphorus	Vol.	Phosphate (mg. per 100 cc.)	Phosphate Clearance
6 to 8 a.m.	4.8	6.6	400 cc.	5.6	160 cc./hr.
8 a.m. 200 USP units parathyroid extract given intravenously					
8 to 10 a.m.	....	....	755 cc.	9.0	504 cc./hr.
10 to 12 m.	5.4	6.2	750 cc.	8.0	480 cc./hr.

The threefold increase in phosphate clearance clearly demonstrated that the patient was responsive to parathyroid extract and that the hypoparathyroidism resulted from a deficiency of parathyroid hormone rather than from refractoriness to this hormone.

Following this test the patient was given dihydrotachysterol (A.T. 10), 1 cc. daily, with a regular diet. As improvement was slow, calcium gluconate and vitamin D were added. Since increasing the serum calcium level without simultaneously lowering the serum phosphorus level favors the development of metastatic calcifications, aluminum hydroxide was given to suppress absorption of phosphorus. As improvement occurred, the urinary excretion of calcium became normal (Sulkowitch: two plus).

The patient was discharged from the hospital on a regular diet with dihydrotachysterol, 1 cc. daily, calcium lactate, 2 gm. daily, aluminum hydroxide, 15 cc. four times daily, and vitamin D, 150,000 units daily. These medications have been maintained and the chemical components of the blood have gradually returned to normal. It has been possible to reduce the dose of dihydrotachysterol to 0.5 cc. per day, on which the patient is free of symptoms or signs of tetany.* Reaction to the Sulkowitch test for calcium remains two plus, and the serum calcium content is 12 mg. per 100 cc. and the phosphate content 3.7 mg. per 100 cc.

The patient stated that she feels more relaxed, no longer has the twitchings and "jumpiness" formerly so annoying, is more stable emotionally, and feels (and her family agrees) that she has regained much of her memory. She has taken no anticonvulsants since discharge. An electroencephalogram taken in September 1949 showed no essential difference from previous records; the intracranial calcifications remain unchanged. The patient is not as alert mentally as she was before the illness but her condition is better than it was during the time anticonvulsant medication was being given. The husband, who had given up his job to take care of her, has returned to work since the patient can now care for herself and her home.

*Current cost to a private patient of the medication presented in this case is approximately $17.70 per month at most pharmacies.

DISCUSSION

The presenting symptoms of idiopathic hypoparathyroidism are extremely varied. The patient may first complain of asthma because of stridor associated with the attacks, of arthritis because of joint stiffness due to muscle spasm, of dim vision because of cataracts, or of epilepsy because of convulsive seizures. Convulsive attacks and papilledema may suggest the possibility of a brain tumor. The diagnosis, however, can be made easily if the possibility of hypoparathyroidism is kept in mind. Positive Chvostek and Trousseau signs should indicate the presence of tetany clinically. The Sulkowitch test* will demonstrate the absence of calcium from the urine and is a simple method for establishing a presumptive diagnosis which then can be confirmed by determining serum calcium and serum phosphorus levels.

The objectives of treatment also are simple—to increase the serum calcium level and to decrease the serum phosphorus level. Unless both objectives are attained, abnormal calcifications may continue to form. The best agent to use for this double purpose is dihydrotachysterol. Vitamin D may be used but should be combined with aluminum hydroxide to decrease phosphorus absorption. Early recognition and treatment of the condition are required to prevent permanent mental damage.

SUMMARY

A case of chronic idiopathic hypoparathyroidism simulating epilepsy has been presented. A few simple procedures for establishing the diagnosis have been emphasized. These are the Chvostek and Trousseau signs and the Sulkowitch test. Blood calcium and phosphorus determinations will establish the diagnosis. The importance of early treatment is stressed, since only by prompt therapy can the patient avoid aberrant calcifications which may result in permanent visual impairment and mental deterioration.

REFERENCES

1. Albright, F., and Reifenstein, E. C., Jr.: The Parathyroid Glands and Metabolic Bone Disease, Baltimore, Williams & Wilkins, 1948.

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3. Sutphin, A., Albright, F., and McCune, D.: Five cases (three in siblings) of idiopathic hypoparathyroidism associated with moniliasis, J. Clin. Endocrinol., 3:625-634, Dec. 1943.

*The Sulkowitch reagent consists of oxalic acid 2.5 gm., ammonium oxalate 2.5 gm., glacial acetic acid 5.0 cc., and distilled water q.s.ad 150 cc. The test is performed by adding 2 cc. of the reagent drop by drop to about 5 cc. of urine in a test tube and noting the amount and speed of appearance of a precipitate. Results are recorded as zero if no cloud appears within two minutes, one or two plus if a fine or heavier cloud appears *after* 30 seconds, and three or four plus if a flocculent or curdy precipitate appears *in less than* 30 seconds.